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(54) Masking method and strip

(57) A method is described of masking a vehicle during spray-painting so as to prevent overspray from entering a gap between adjacent body panels (2,3). It involves using a foamed plastics strip in a variety of ways to seal the gap. For example, the strip can be bent into a loop to fill the gap with both edges of the strip being adhesively attached to the vehicle. Alternatively, the strip can be overlapped with or rolled up into the gap. The masking strip comprises a web of foamed plastics material having adhesive on one or both faces thereof, the adhesive being confined to a track close to an edge of the strip.

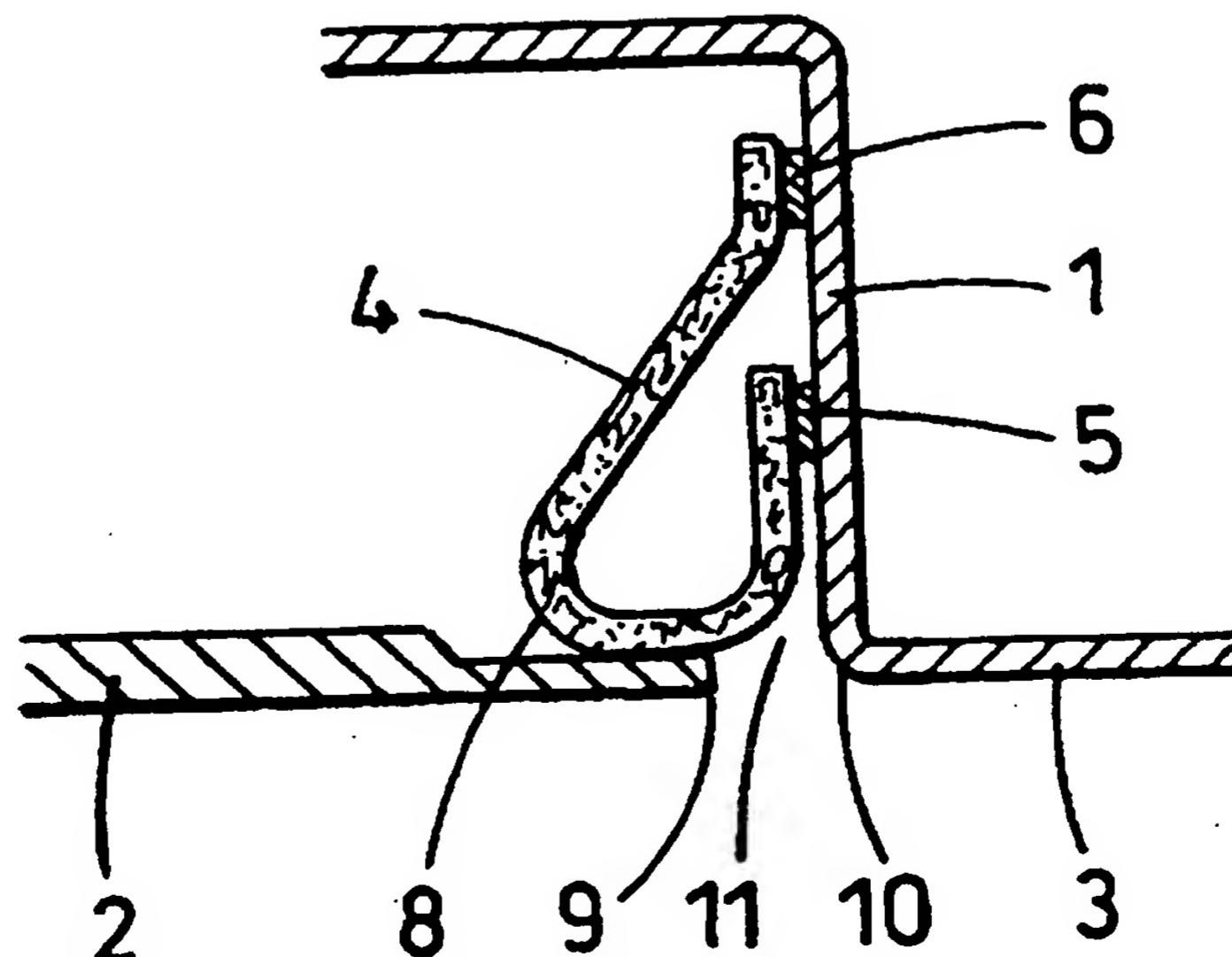


Fig. 2

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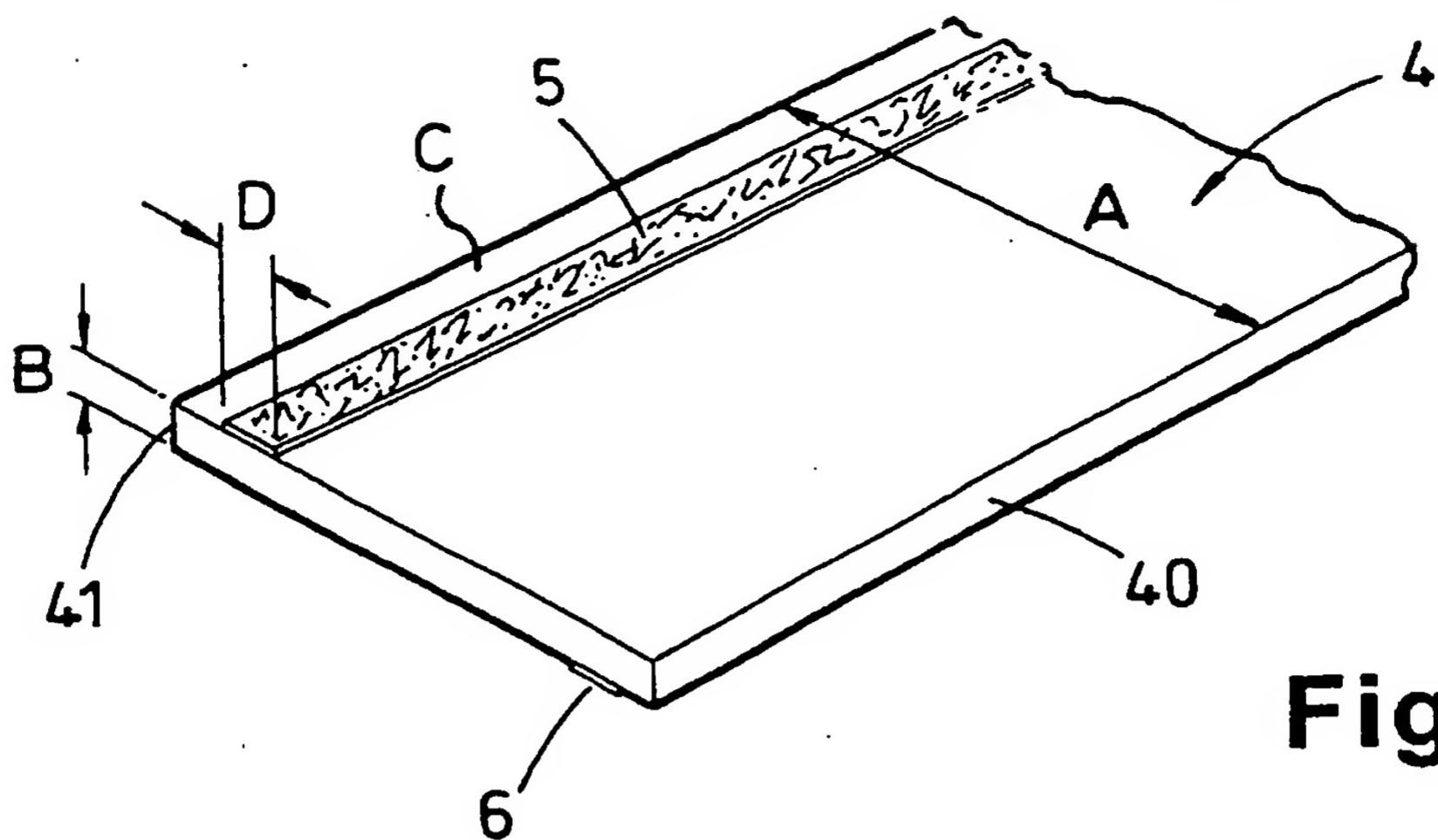


Fig. 5

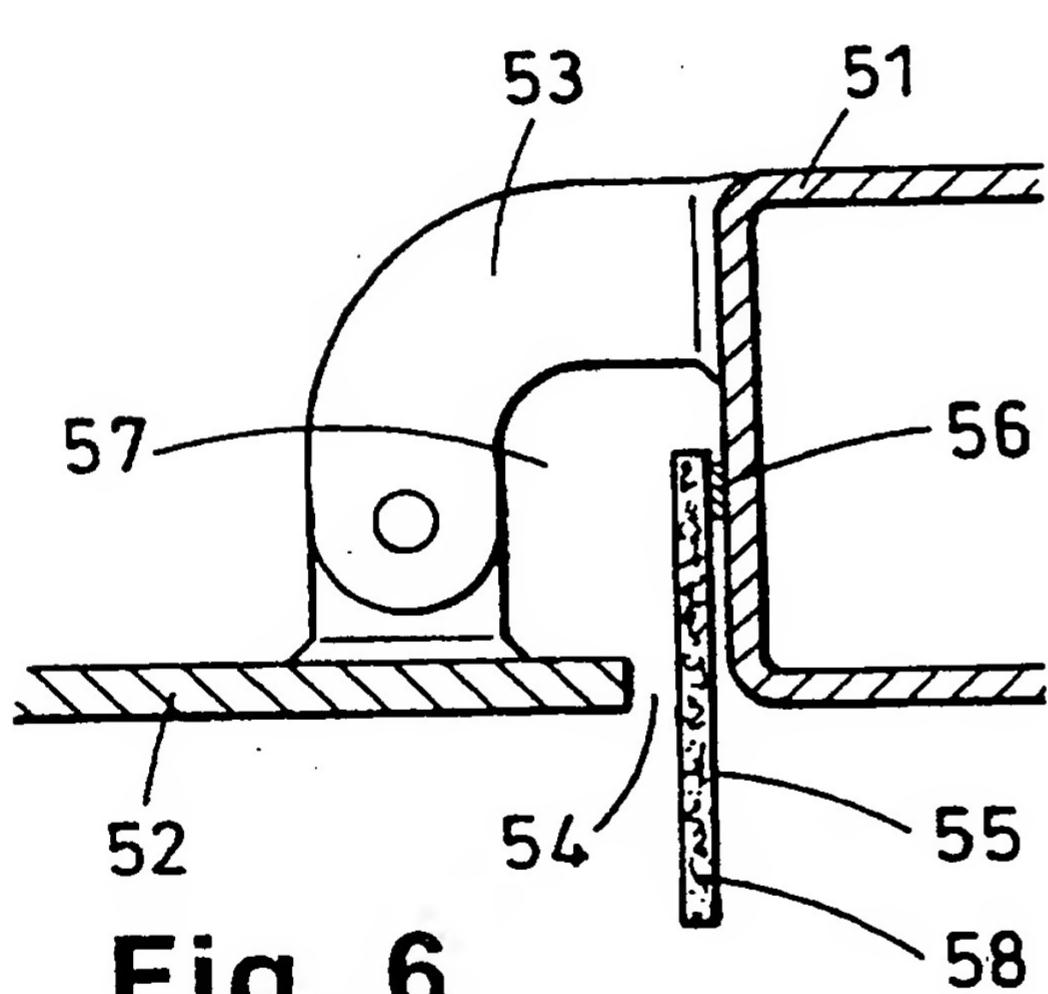


Fig. 6

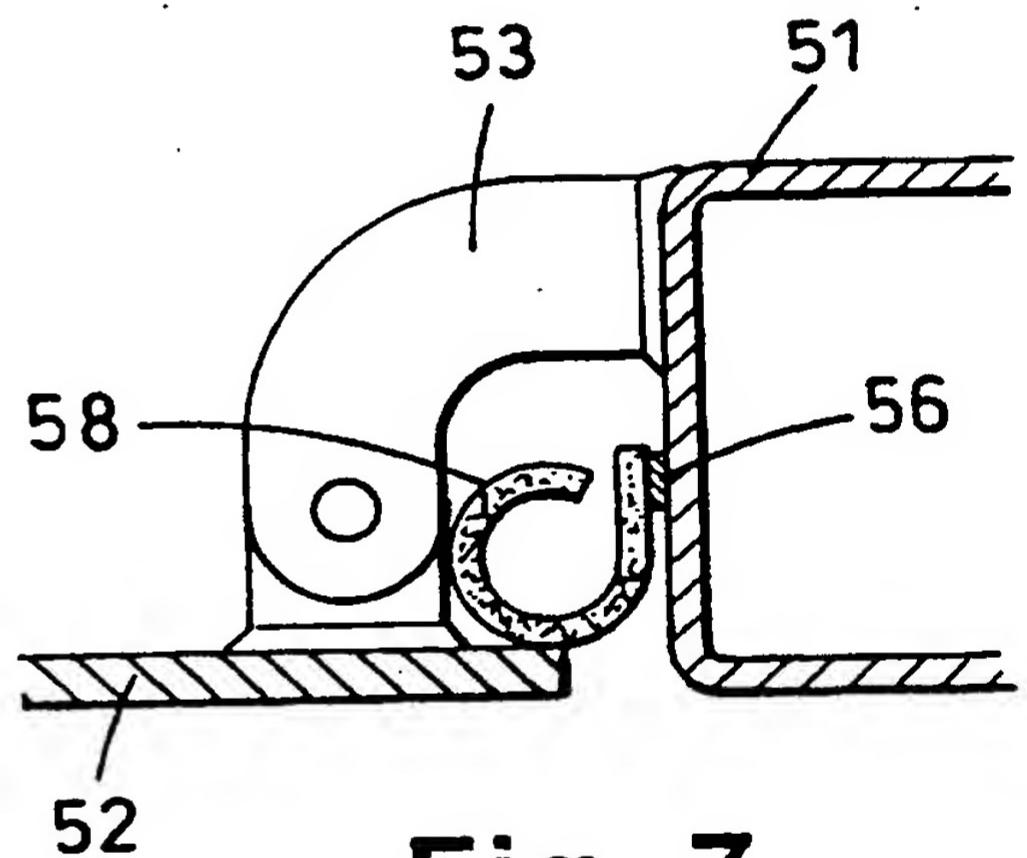


Fig. 7

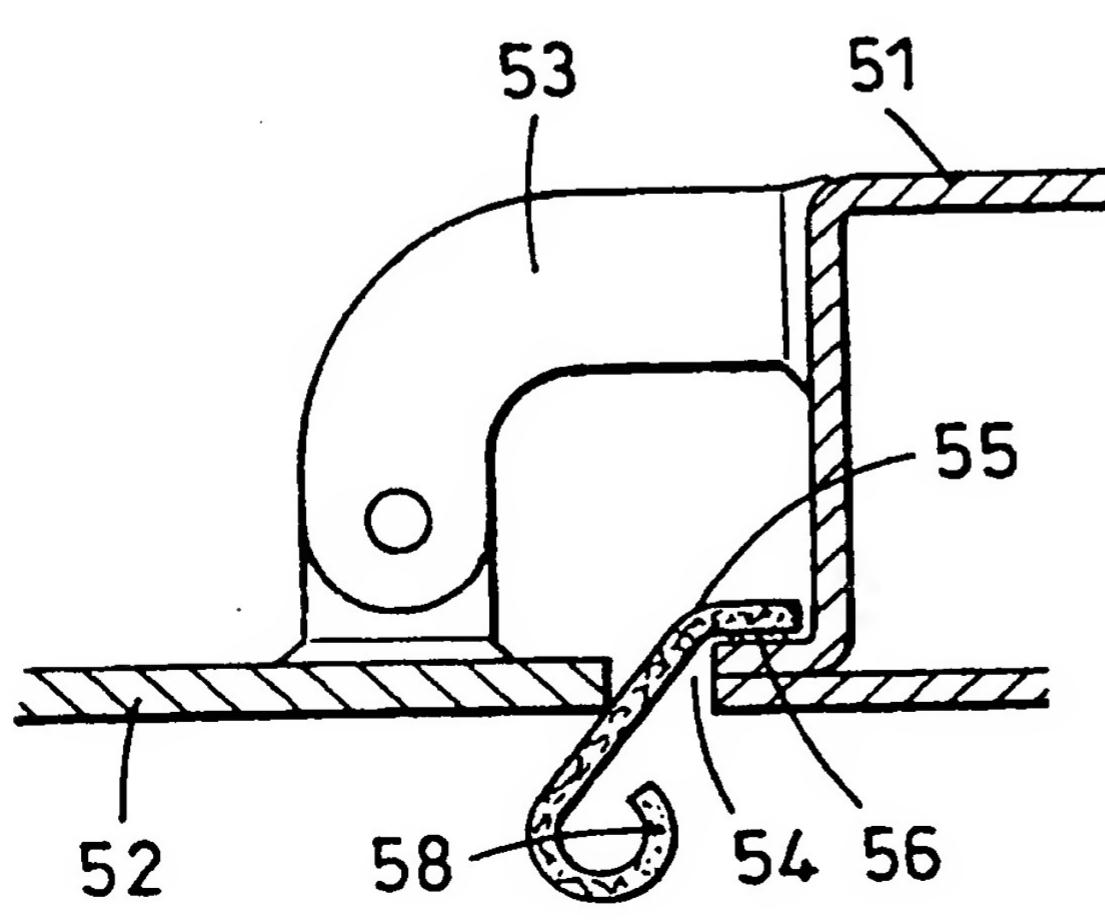


Fig. 8

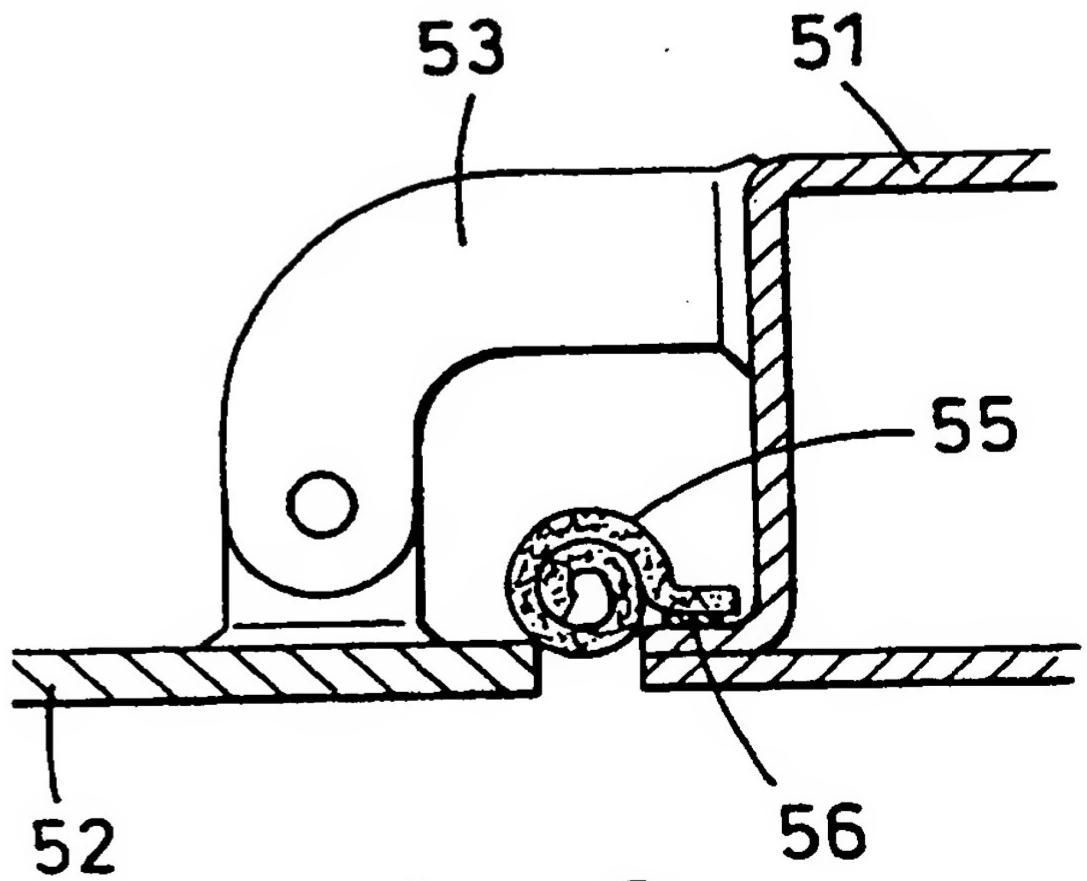


Fig. 9

substantially parallel therewith and applying a paint spray to the panel or panels, whereby the looped strip prevents paint from entering the gap.

Preferably, the method is carried out in such a way that the loop of foamed strip is positioned in such a way that the surface of the body panels lies substantially tangentially to the outer curved surface of the loop. Thus, the loop of foam may lie substantially within the gap between the body panels but has a tip of its curved surface essentially aligned with the surface of the body panels, or slightly protruding therefrom. By positioning the foam in this way, an elongate recess or pocket is formed between a curved portion of the surfaces of loop and the body panel. As the paint is sprayed into this recess, the tapering surfaces of the loop and recess cause turbulence in the paint spray which results in a blending of the paint coating to the edge of the panel without any build-up of paint.

While it is theoretically possible to apply adhesive to the vehicle and then adhere the foam to the vehicle, this is not very convenient in practice. It is preferred, therefore, to apply the adhesive to the strip in the region of the edge. The adhesive may be applied to the edge of the foamed strip but, generally, it is easier and more convenient to apply the adhesive to a face of the strip in the region of the edge. The adhesive can be applied as discontinuous areas, e.g. as spots, along the length of the strip but it is preferred to apply a continuous adhesive track longitudinally of the strip. A loop is more conveniently formed by applying the adhesive to opposite faces of the strip, with the adhesive confined to an area close to an edge of the strip. The greatest flexibility in forming the loop is achieved by applying two longitudinal tracks to opposite surfaces, each track being confined to an area close to opposite edges of the strip.

described in detail in, for example, Kirk-Othmer Encyclopaedia of Chemical Technology, Third Edition, Vol. 11, pages 82 to 126. Such foams include polystyrene, PVC, polyethylene, polyurethane, polyisocyanate, polyester and polysilicone foams. The foams are preferably of open cell structure and generally foams having a density in the range of 10 to 55 kgs, preferably 10 to 30 kgs per cubic metre are useful for the purposes of the invention. Any suitable blowing agent such as volatile liquids, e.g. hydrofluorocarbons and hydrocarbons such as butane may be used. In the case of polyurethane foams, water is a suitable blowing agent.

The choice of an open-celled foam and the positioning of the loop away from the adhesive track or tracks is important. While not wishing to be bound by any particular theory, it is believed that the paint ridges which are formed when masking tape is used to mask an area to be painted are caused by the layer of adhesive which forms a dam which is impenetrable to paint. In contrast, the loop of open-celled foam which seals off a panel gap allows penetration of some paint and the adhesive track is removed by a substantial distance from the area of the seal.

Polyurethane foams may be manufactured by mixing a polyol, such as a polyether-glycol, toluene diisocyanate and a blowing agent. If water is used as the blowing agent, it reacts with the isocyanate to produce carbon dioxide, which is the effective blowing agent. Details of procedures for the manufacture of polyurethane foams can be found in Chapter 7 of "Polyurethanes Chemistry, Technology and Applications" by Zygmunt Wirpsza, English Edition, published by Ellis Horwood Ltd., 1993.

The adhesive coating may be applied by spray or other applicator to the foam after the block has been slit into strips. The adhesive may be applied in a track or band extending longitudinally of the conduit. Where two or more adhesive tracks are

Figure 3 is a view similar to Figure 2, but without showing the door, of a second embodiment of the strip;

Figure 4 is a section through part of a bonnet lid and adjacent wing portion;

Figure 5 is a perspective view of a strip in accordance with the invention;

Figure 6 is a section through an A-frame of a vehicle door in the region where it is hinged, showing a second embodiment of the invention;

Figure 7 is a view similar to Figure 6 after tucking the edge of the strip into the space between the A-frame and the door panel;

Figure 8 is a section through an A-frame of a vehicle door similar to Figure 6; and

Figure 9 is a view similar to Figure 7 but after rolling and introducing the strip into the gap in a different manner.

Referring to the drawings, and in particular to Figures 1 and 2, this shows a vehicle B-frame (1) and a section of a door (2) about to close onto the B-frame. Assuming it is desired to spray paint the surface of a panel (2) and/or (3) adjacent to the B-frame, the foamed polyurethane masking strip is adhered to the B-frame (1) in the following manner. Strip (4) has an adhesive track (5) along one edge of the strip and a second adhesive track on the opposite surface, but close to the opposite edge. Adhesive track (5) is bonded first to the B-frame (1) in a convenient position and adhesive track (6) is then bonded to the same B-frame in a position so as to produce a loop portion (7) whose outer surface (8) is generally aligned with the surface (3) of the panel to be refinished, or protrudes slightly beyond it. Loop (7) is also positioned so that edge (9) when closed, seals against a surface (8) of the loop.

Figure 2 shows the situation in which the door (2) has been closed onto the loop portion (7) thereby forming a seal between the door and the loop. The paint

With this construction, a loop can be formed in the desired juxtaposition with regard to the panel (3) by adhering the adhesive (6) to the desired point along the face (13) of the foam strip. It is, however, preferred to have adhesive tracks at opposite edges as shown in Figures 1 and 2, because the adhesive does not bond as firmly to the vehicle body work as it does to the foam and, therefore, a degree of repositioning is more easily achieved in the embodiment of Figures 1 and 2.

In the case of the embodiment of Figure 3, it may be difficult to remove the face (13) from the adhesive track (6) if the loop has not been positioned correctly in the first instance, unless the face (13) is treated with a material which reduces the strength of the bond to that face.

Figure 4 illustrates an advantage of the present invention for masking gaps between a bonnet lid (or hood) (30) and a surrounding panel (32). In this aspect of the invention a foam strip (4) can be bonded either in the manner shown in Figure 1 or in the manner shown in Figure 3, to form a very tightly packed seal within the gap between the panels (30) and (32). This has a particular advantage in the case of bonnet lids having a downwardly directed flange (34). The flange (34) can act as a scraper blade displacing packing inserted between the surfaces (30) and (32) in order to seal the gap.

With a strip in accordance with the invention, the two edges can be adhered to a surface (36) depending from the surface (32) in such a way that the web is tightly adhered to the surface (36). The closure of the bonnet lid (30) then shows no tendency to displace the foam strip from its adherence to the surface (36).

Figure 5 shows a perspective view of one embodiment of the strip in accordance with the invention. The strip comprises an elongate strip of foam of generally rectangular cross-section having a width (A) and a thickness (B). Typically,

Figures 8 and 9 show similar views to Figures 6 and 7 of sections through the A-frame and surrounding door portions and the same reference numerals have been used to indicate equivalent components. In Figure 8, one longitudinal edge of the strip (55) has been bonded to the inside of a flange attached to the A-post (51) by an adhesive track (56) so that the strip projects from the gap. The longitudinal edge (58) is rolled inwardly to form a tightly rolled coil which is then pushed into the gap as shown in Figure 9. The strip can be rolled in portions of about 2 ~ 3 inches along its length and each rolled portion pushed substantially into the gap. The strip remains substantially coiled and effectively seals off the gap.

10. A foamed strip for use in spray painting of vehicles which comprises an elongate web of open-celled foam having a length and a width and having at least one track of pressure-sensitive adhesive in the region of one edge of the strip, said track extending in a direction substantially parallel to the length of the strip.

11. A method of painting a vehicle having adjacent first and second body panels with a gap therebetween, said method comprising adhering one edge of a foamed plastics strip to a surface forming one side of the gap so that it projects out of the gap, lapping the other edge of the strip on to a first panel and adhering said other edge thereto, whereby the second panel can be sprayed with paint while the first panel is protected from overspray.

12. A method of painting a vehicle having adjacent first and second body panels with a gap therebetween, said method comprising adhering one edge of a foamed plastics strip to a surface associated with one side of the gap so that the strip projects out of the gap and rolling the strip parallel to the free edge and pressing the rolled strip into the gap.

8. A strip as claimed in any one of claims 4 wherein the foam comprises an open-celled foam.

9. A strip as claimed in any one of claim 5 wherein the adhesive is a pressure-sensitive adhesive.

10. A foamed strip for use in spray painting of vehicles which comprises an elongate web having a surface of open-celled foam, said strip having a length and a width greater than its thickness, the thickness being substantially uniform and said strip having a track of pressure-sensitive adhesive on each face of the strip, each said track extending in a direction substantially parallel to the length of the strip and being located in the region of the edges of the strip.

11. A method of painting a vehicle having adjacent first and second body panels with a gap therebetween, said method comprising adhering one edge of a foamed plastics strip of substantially uniform thickness to a surface forming one side of the gap by a first adhesive track which extends longitudinally of the strip and is adhered to a first surface of the strip so that the other edge of the strip projects out of the gap, lapping the other edge of the strip on to a first panel and adhering said other edge thereto by a second adhesive track which extends longitudinally of the strip and is adhered to the surface of the strip opposite to the first track, whereby the second panel can be sprayed with paint while the first panel and the gap are protected from overspray.

12. A method as claimed in claim 11 wherein said surface forming one side of the gap is connected to said second panel.



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Claims searched: 1-3,10,12

Examiner: Neil Franklin
Date of search: 26 March 1996

Category	Identity of document and relevant passage	Relevant to claims
P,X	WO 95/21700A1 (SPEEDARRIVE) Note entire document	1-3,10

- X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
& Member of the same patent family

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P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.